Anchorages Municipal Landfill Clips

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By David Bedard
JBER Public Affairs

8/31/2012 - **JOINT BASE ELMENDORF-RICHARDSON, Alaska** -- During an especially cold December afternoon, a swirling formation of obsidian ravens hovered over a gray chimney, the structure pushing out hot air in the form of burned methane gas and oxygen combusted into water and carbon dioxide. Perhaps the black birds liked the heat. Perhaps they liked the extra lift. Chances are, it was the tantalizing combination of both that attracted the feathered acrobats.

Currently, the Anchorage Municipal Solid Waste Landfill - adjacent to JBER - collects and burns landfill gas to comply with EPA regulations. The gas is primarily methane - a rather simple molecule composed of a single carbon atom bonded to four surrounding hydrogen atoms.

With an eye to the future, officials at JBER, the Municipality of Anchorage and Doyon Utilities put their heads together to find a way to convert the landfill gas from a diversion for ravens into usable energy for the military base.

The JBER Landfill Gas Waste to Energy Plant is scheduled to begin operations January 2013 and is projected to generate more than 56,000 megawatt hours or 26.2 percent of JBER's electrical load, said Tim Berg, 673d Civil Engineer Squadron asset optimization chief.

"Here (the municipality was) flaring the gas and getting no benefit other than maybe the ravens like to soar in the plume," Berg said. "Now, we're turning it into electricity for the base to use."

Mark Madden, manager of planning and engineering, Municipality of Anchorage Solid Waste Services, said he has been eager to convert the costly flare into a profitable enterprise for the municipality.

"For the past five years, we have been just burning this gas," Madden explained. "And it's costing us about $60,000 per year to get rid of it. With this project, we don't burn the gas off, we sell it. The base gets electricity, we get rid of our gas."

Berg said once it was determined the gas would be sold rather than burned, the municipality put out a bid for a customer. Because military construction projects can take years to plan and execute, and the federal government cannot bid on its own behalf for such projects, Berg said the policy of privatization was beneficial to ensure JBER would have access to the methane gas for energy use.

"It was advantageous for us to have a privatized utility contractor...who could take those steps in partnership with the military as well as the municipality and the state," he said.
Leveraging a $2 million grant from the Alaska Energy Authority and a 30 percent tax benefit from the federal government, Berg said the project will become cash positive in the third or fourth year of operation and save an estimated $50 million during the 46-year life of the project.

Perhaps more crucially, Berg said the plant ensures JBER will more than exceed renewable energy goals established by executive orders 13423 and 13514 as well as Section 203, Energy Policy Act of 2005.

These mandates require federal agencies use renewable energy to meet at least 7.5 percent of total electric consumption beginning 2013. Because the generator plant is located at JBER, the installation is able to double count credit at 52.4 percent, or nearly seven times the goal.

"(The plant) is important from a regulatory standpoint," Berg said. "It's mandated by our commander in chief. But also it's just the right thing to do."

Marvin Riddle, Doyon Utilities consultant, said the plant is a system of systems beginning at the landfill where a network of pipes feed into a central point through suction of a blower.

"Right now, that gas is being pushed straight into a chimney flare that basically burns all of those (British thermal units)," Riddle said. "The new system is going to divert that into a processing skid."

The skid - or gas processing module - sits along side of the flare, which will be idled once the plant is fully operational. Once the gas hits the skid, it is discharged at approximately 9 psi, picking up heat. The heat is taken out by an inline cooler and the process also removes moisture. The gas goes through another pre-heater and another heat exchanger where more water comes out.

Each time water comes out, it removes sulfur and siloxane, impurities that would be harmful to the engines in the plant.

The gas is then pushed down to the generator plant to a header where the gas pressure is reduced to approximately 1.5 psi for ingestion into the plant's current complement of four 20-cylinder generators.

The engines are designed to run primarily on methane, but they can also run on natural gas or a mixture of both if there is an interruption of supply.

"(The gases) can be automatically blended as the engines are running," Riddle said. "So if you lose either fuel, the base should not lose any power."

Berg said the plant will expand to five generators by late 2013 because there is enough methane production. Today, there is enough garbage composting in the landfill to provide methane for the life of the unit. The plant will be tied to the existing JBER-Richardson grid through electric distribution.

Additionally, the plant is large enough to accommodate an array of Organic Rankine cycle heat-recovery units capable of adding 1 megawatt to the plant's electric-production capability should the addition of the units prove to be economically viable.

Madden said the plant is a boon for JBER, the municipality and utilities privatization.

"At the end of the day, this really proved to be the best fit for everyone all the way around," he said. "We're neighbors. We have a lot of shared interests in the ground we're standing on."

New power plant expanding thanks to extra gas from Anchorage landfill
Anchorage Dispatch
Suzanna Caldwell
May 6, 2013

Exhaust stacks on the JBER Landfill Gas Waste to Energy Plant, adjacent to the Anchorage Municipal Landfill. The plant burns methane from the landfill, supplying about half of Ft. Richardson's energy needs. April 30, 2013

Anchorage's gassy landfill isn't just letting its methane blow in the wind anymore. Since January, methane from the Anchorage Municipal Solid Waste Landfill has been processed and sent less than a mile away to the Joint Base Elmendorf Richardson's Gas Waste-to-Energy plant. The new plant takes methane that would have been burned off and converts it to electricity that powers the Army side of the joint base.

Related:
Photos: Inside Anchorage landfill gas-power plant

The $30 million plant built by Doyon Utilities, which is contracting with JBER, is exceeding expectations, according to Bob Zacharski, site manager for Doyon Utilities.

Anchorage's landfill has turned out be gassier than expected, emitting 2,050 cubic feet of methane a minute, of which the plant uses 1,800 cubic feet, said plant operator Greg Mitchell. The remaining 250 cubic feet is burned off, a prospect the rest of the gas would face if not for the power plant.
With the landfill expected to receive trash another 40 years, Mitchell is excited about its methane prospects. "We like people with horses," he joked.

Zacharski said Doyon is paying the city an estimated $50 million for 20 years of gas (prices fluctuate slightly based on Henry Hub pricing). But even $50 million is significantly cheaper than what it would cost the base to buy natural gas to supply the base's power plant. Zacharski estimates it will save the base $30 million over the same time period.
The plant is in the process of installing a fifth generator, an addition that wasn't expected for another five years. Instead, the plant was ready for the fifth generator after just eight months of operation because the Anchorage landfill produced more methane than expected.

Zacharski said the plant can handle a sixth generator, which is normally scheduled for installation after 10 years of operation. That timetable could be pushed up, based on gas supplies, he said.
Today, the plant produces half of the energy consumed by the Fort Richardson side of the base, or about 25 percent of JBER's electricity. When the fifth generator comes online this summer, 65 to 70 percent of Fort Richardson's power demand should be covered, according to Greg Mitchell, power plant operator. Today's production of 5.6 megawatts an hour will rise to 7.1.

Overall, its a relatively small amount of electricity. By comparison, ML&P and Chugach's newest power plant, the Southcentral Power Project, is capable of producing 183 megawatts of power.
The rest of the base, including the Elmendorf Air Force side. is powered by ML&P.

Gas waste-to-energy not only makes the base more sustainable, as mandated by executive orders from President Obam; it also has national-security ramifications. In the event of a widespread ML&P outage, the plant, coupled with a backup 9-megawatt emergency diesel power plant, would supply nearly all of Fort Richardson's power.
Contact Suzanna Caldwell at suzanna(at)alaskadispatch.com

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Anchorage Powers Up Methane Power Plant
Alaska Public Media
By Daysha Eaton, KSKA - Anchorage |

July 31, 2012 - 5:35 pm

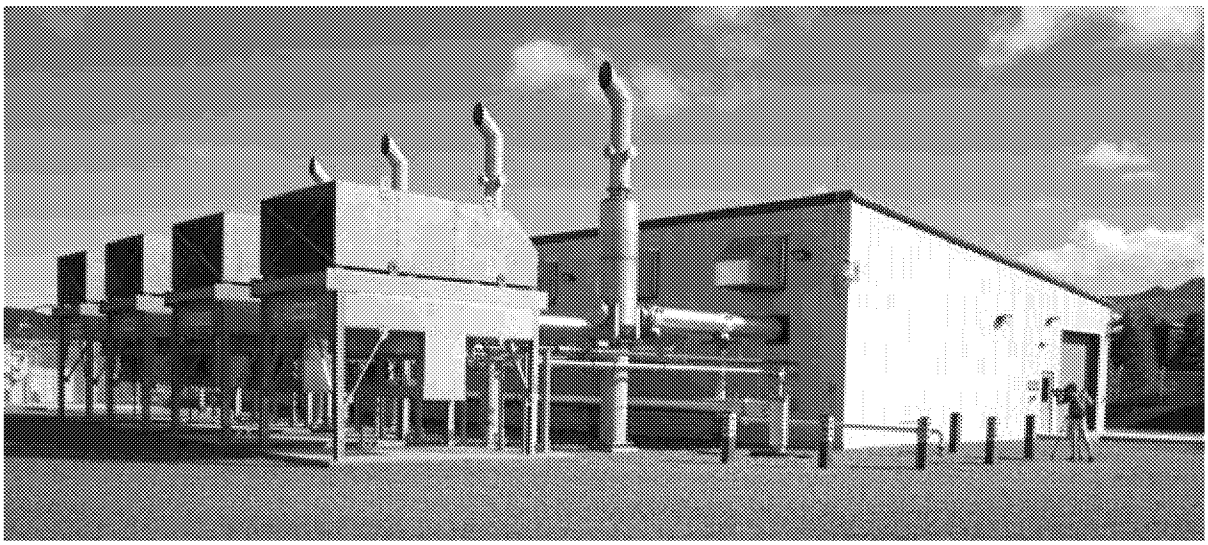

Photo by Daysha Eaton, KSKA - Anchorage

Officials fired up the state's first methane power plant at the Anchorage Regional Landfill Tuesday. Doyon Utilities built the $26 million plant this summer. It uses methane gas created by decomposing garbage to create electricity. Doyon Utilities, The Municipality of Anchorage and Joint-Base Elmendorf Richardson partnered on the project.

(From left) Dan Gavora, Colonel Duffy, and Mayor Sullivan prepare to bring the power plant online. Photo by Daysha Eaton, KSKA - Anchorage

Dignitaries gathered to celebrate completion of the plant, which has been in the making since 2004. Dan Gavora is the president of Doyon Utilities. Hey says the plant is a win for all involved.

"The energy we create with this plant will generate revenue for the city, provide energy security for the joint base, lower overall energy cost and reduce pressure on local energy infrastructure and resources. All using, what until now, was an undesirable bi-product of city waste collection, an emission that had to be collected and flared to meet environmental protection standards," Gavora said.

It's also a win for Doyon Utilities. The company – owned by Doyon Limited and Fairbanks Sewer and water – was created in 2005 specifically to service the military installations in Alaska. The plant will offset the power usage for the Fort Richardson part of JBER in Anchorage. The landfill was creating methane gas anyway, but until now they were 'flaring' it, as required by EPA guidelines. Now, instead of being released into the atmosphere as pollution, it's being funneled into a 6,000-foot pipeline leading to the plant.

"It comes in, we reduce it down to one and half pounds, it goes into the turbo charger, goes into the engine, it burns the gas, drives the generator and makes electricity," Marvin Riddle, who is managing the project for Doyon Utilities, said.

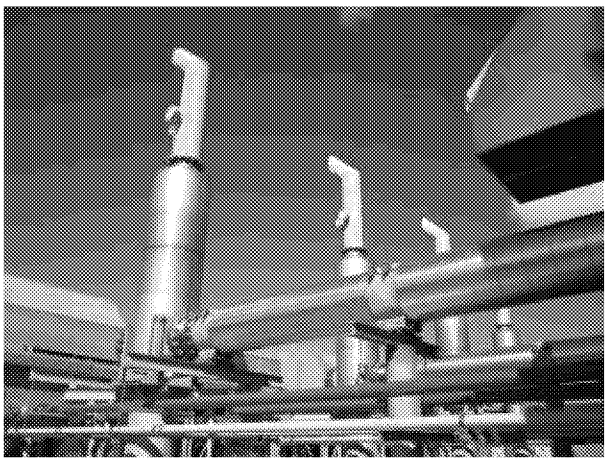

Photo by Daysha Eaton, KSKA - Anchorage

The plant is equipped to burn methane from the landfill and natural gas. When there's not enough methane, it will switch over to using natural gas. Right now it produces 5.6 megawatts of power feeding directly into the grid. That offsets JBER-Richardson's summer power usage by 80 percent and supplies 55 percent of their winter power needs. There's room for expansion as the city, the base and the landfill grow. The plant is, in part, a result of a renewable energy goal set by the Department of Defense in the early 2000s. Colonel Bryan Duffy is the commander of Joint Base Elmendorf-Richardson and the commander of the 673rd Airbase Wing. He says the plant just made sense.

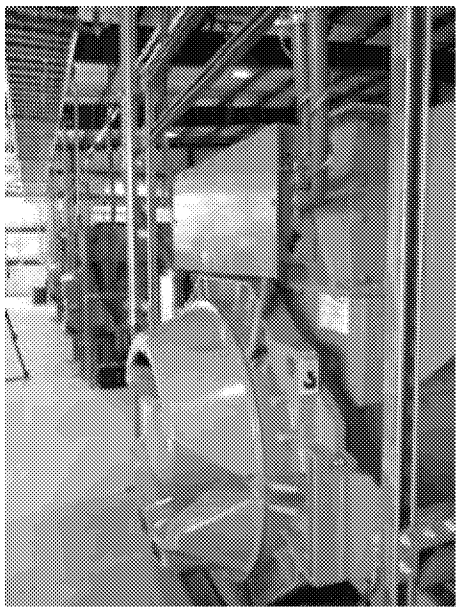

Photo by Daysha Eaton, KSKA - Anchorage

"When you've got a landfill that's got to be tended to, a privatized partner in the utility system like Doyon and the electrical demand has, and honestly is competing for supplies that affect the local community, it just made a lot of sense to see this project move forward and we're glad to see it today," Duffy said.

The Anchorage Assembly awarded Doyon Utilities the project in 2011 and it was completed this summer with the aid of a $2 million construction grant by the Alaska Energy Authority.

Anchorage Mayor Dan Sullivan was on hand to celebrate the project. He says he's excited about the many independent power projects being developed in Southcentral Alaska.

"We know that across the inlet Ormat's looking for geothermal possibilities. We've got, of course, the Watana Dam, looks like it's moving forward. Hydro certainly is renewable. Some of the coal seam projects may not be true renewables, but they're certainly unconventional and the ability to use coal without mining it and burning it in the atmosphere is pretty exciting and of course the wind farm – maybe by this fall we'll see turbines spinning for the wind farm. So a lot of exciting things are happening for renewable energy resources," Sullivan said.

Photo by Daysha Eaton, KSKA - Anchorage

Officials says the municipality is expected to collect over $51 million in revenue from the sale of its landfill gas fuel supply and project-related property tax revenues over the 20-year term of the contract. The federal government will obtain electricity at a lower cost with an estimated savings of $32 million over that period. And JBER will exceed its federally mandated goals for renewable energy. Methane power plants are quite common in the Lower 48. But this is the first one in Alaska – and likely the only one for a while. According to officials, Anchorage is the only city in the state big enough to supply enough garbage, and methane, to produce power.